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Hideki Sawada

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EXAMINER

LEE, CHEUKFAN

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,729	Applicant(s) SAWADA, HIDEKI	
	Examiner Cheukfan Lee	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-8 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-8, and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Claims 1, 3, 4, 6-8, and 11 are pending. Claim 1 is independent.
2. Applicant's arguments filed March 26, 2008 with respect to claim 1 have been fully considered but they are not persuasive. Claim 1 has been amended to include the limitations of claim 5, which depended on claim 2, both of which are now canceled. However, Applicant's arguments presented on page 6 with regard to Saito (U.S. Patent No. 6,512,603) and Furusawa et al. (U.S. Patent No. 6,357,903) are not persuasive.

Response to Applicant's arguments and rejection of the claim follow.

A. Response to Applicant's arguments

Applicant states, on page 6, paragraphs 2 and 3 of the remarks, that because the light guide (205 in Fig. 14) of Saito is not transparent and can prevent leakage of light from the light guide properly, the reference does not need to add to the apparatus a reflector, such as the reflector of Furusawa et al., which prevents emission of noise light, and in addition, Saito seeks to avoid an increase of size of the apparatus and costs, due to an increase in the number of parts and his objective is to provide a small apparatus that could be easily assembled (referring to col. 2, lines 30-38 of Saito). However, Saito, while does not disclose that the light guide (205 in Fig. 14) is transparent, does not explicitly disclose that the light guide (205) is not transparent and can prevent leakage of light from the light guide properly. Like Saito, whose objective is to provide a small apparatus that could be easily assembled, as pointed out by

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Applicant, Furusawa et al. teaches a small apparatus that could be easily assembled, without using adhesive, by fitting the convex portion (5d) formed on an interior surface of the reflector (case 5) into the concave portion (4d) formed in a portion of the transparent light guide (4) (Fig. 1, col. 5, lines 41-47). Further, the space in the case (1 in Fig. 14, also 109 in Fig. 11) of Saito provided for accommodating the light guide (217) relative to the case (1) is similar in size to the space in the case (1 in Fig. 1) of Furusawa et al. provided for accommodating the light guide (4) and the reflector (5). Saito does not disclose how the light guide is assembled or how the guide stays in place within the space therefor. One of ordinary skill in the art would have realized the advantage of substituting the light guide of Saito with the transparent light guide (4) and reflector (5), which are easily assembled in the case and yet are high efficient in illumination (Furusawa et al., col. 5, lines 41-47 and col. 6, lines 11-17).

Applicant further states that Furusawa does not disclose or suggest a partition wall that is provided on the case (1) and separates the light guide and the sensor IC chips as claim 1 requires and accordingly, does not disclose or suggest that the reflector (5) is provided on such partition wall as claim 1 requires. The examiner disagrees. Fig. 1 of Furusawa et al. shows a partition wall (between reflector 5 and the space in which the sensors 7 are disposed) with which the case (1) is provided and separating the light guide (4) and reflector (5) from the sensors (7), just as Fig. 11 of Saito showing the partition wall (see approximately the middle part of Fig. 11) with which the case (109) is provided (see related language of present claim 1) and

separating the light source (117) and the sensor chips (112) (col. 1, lines 18-50). Fig. 1 of Furusawa et al. further shows that the reflector (5) is provided on the partition wall.

Thus, for the reasons given above, the rejection of claim 1 under 35 U.S.C. 103(a) is proper, and the rejection stands. See rejection below.

B. Rejections of the claims 1, 3, 4, and 6-8

B1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

B2. Claims 1, 3, 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent No. 6,512,603) in view of Furusawa et al. (U.S. Patent No. 6,357,903), both of which were applied in the previous Office action.

Regarding claim 1, Saito discloses an image reading apparatus (the embodiment shown in Figs. 11 and 12, Fig. 11, col. 1, lines 18-38) comprising a light source (117) for illuminating an image reading region (see upper surface of glass 101) extending in a primary scanning direction (the direction into the page, Fig. 11), a case (109) for accommodating the light source (117), a substrate (118) including a first side edge (the edge including the upper left corner of 118 in Fig. 11, which shows a cross-sectional

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view of 118; the edge of the upper surface of 118 shown at the lower part of Fig. 12) and a second side edge (the edge including the upper right corner of 118 in Fig. 11, which shows a cross-sectional view of 118; the edge of the upper surface of 118 shown at the upper part of Fig. 12) spaced from each other in a secondary scanning direction (left-right direction, Fig. 11) which is perpendicular to the primary scanning direction, the substrate (118) being mounted to the case (109), a plurality of sensor IC chips (112, Fig. 12) for detecting light traveling from the image reading region (see upper surface of glass 101, Fig. 11), the sensor IC chips (112) being mounted on a principal surface of the substrate (118) at positions closer to the second side edge (the upper edge of 118 shown in the upper part of Fig. 12) than to the first side edge, a wiring pattern formed on the substrate (118) (Fig. 12), and a plurality of wires (the wires extending from top surfaces of sensor IC chips 112) electrically connecting the sensor IC chips (112) and the wiring pattern to each other (Fig. 12), wherein each of the wires is connected to the wiring pattern by extending from a corresponding one of the sensor IC chips (112) toward the first side edge of the substrate (118) (the side edge of 118 that is closer to printed circuit board 126 as viewed in Fig. 12) (Figs. 11 and 12).

Saito's case (109) for accommodating the light source (117) is provided with partition wall (see approximately the middle of Fig. 11) for separating the light source (117) and the sensor IC chips (112). The partition wall is spaced from the substrate (118).

Saito's embodiment of Figs. 11 and 12 differs from the claimed invention in that **a)** the light source (117) does not include a light guide, and **b)** the embodiment does not have a reflector provided on the partition wall and held in contact with a light guide of the light source go prevent light from leaking from the light guide.

With regard to the difference **a)**, i.e., the light guide, in another exemplary embodiment of Saito shown in Figs. 14 and 15 (col. 1, line 61 - col. 2, line 10), the light source (217) includes an LED package and a light guide (light guiding plate 205) for guiding light from the LED package to the image reading region. One of ordinary skill in the art would have realized the benefit of reduced power consumption by employing the light guide (205) to increasing the brightness of light from the LED package. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the light source (117) of the embodiment of Figs. 11 and 12 of Saito with the light source of the embodiment of Figs. 14 and 15, which include the light guide (205), in order to reduce power consumption and yet achieve substantially the same brightness level of light to illuminate the image reading region.

With regard to the difference **b)**, i.e., the reflector provided on the partition wall and held in contact with a light guide of the light source to prevent light from leaking from the light guide, Saito does not disclose a reflector as claimed. Saito does not the type of material of the light guide (205) is made of, which allows the light guide to leak

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light. Furusawa et al. discloses a line type illuminator for illuminating a document being read in an image reading apparatus (Fig. 1), the illuminator comprising a transparent light guide (4) made of transparent resin, which provides high light transparency (col. 5, lines 48-51). Furusawa et al. further discloses a reflector (case 5) held in contact with the light guide (4) to prevent light from leaking from the light guide (4). The reflector (case 5), formed with a white resin, which has high reflectivity of light, reflect with its interior surface light from the light guide (4) back to the light guide to increase efficiency of the illuminator (col. 5, line 66 - col. 6, line 17). The reflector (5) is provided on a partition wall (between reflector 5 and the space in which the sensors 7 are disposed) with which the case (frame 1) is provided, the partition wall separating the light guide (4) and reflector (5) from the sensors (7), just as Saito's partition wall (see approximately the middle part of Fig. 11) with which the case (109) is provided, separating the light source (117) and the sensor chips (112) (col. 1, lines 18-50).

Saito's objective is to provide a small apparatus that could be easily assembled (col. 2, lines 30-38). Furusawa et al. teaches a small apparatus that could be easily assembled, without using adhesive, by fitting the convex portion (5d) formed on an interior surface of the reflector (case 5) into the concave portion (4d) formed in a portion of the transparent light guide (4) (Fig. 1, col. 5, lines 41-47). Further, the space in the case (1 in Fig. 14, also 109 in Fig. 11) of Saito provided for accommodating the light guide (217) relative to the case (1) is similar in size to the space in the case (1 in Fig. 1) of Furusawa et al. provided for accommodating the light guide (4) and the reflector (5). Saito does not disclose how the light guide is assembled or how the guide stays in

place within the space therefor. One of ordinary skill in the art would have realized the advantage of substituting the light guide of Saito with the transparent light guide (4) and reflector (5), which are easily assembled in the case and yet are high efficient in illumination (Furusawa et al., col. 5, lines 41-47 and col. 6, lines 11-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the light guide of the obvious apparatus of Saito discussed above with the light guide (4) of and reflector (5) to allow easily assembly and provide high efficient illumination as taught by Furusawa et al.

Regarding claim 3, the transparent light guide (4 of Furusawa et al.) discussed for claim 1 is made of transparent resin (col. 5, lines 48-51).

Regarding claim 4, the partition wall of Saito (Fig. 11) discussed above for claim 1 includes a flat surface (see about the middle of Fig. 11) extending parallel to the principal surface of the substrate (118) (the upper surface of 118 as viewed in Fig. 11), and the wires (the wires extending from the top surfaces of the sensor IC chips 112 as discussed for claim 1) enter between the flat surface and the principal surface of the substrate (118) at least partially (Figs. 11 and 12, col. 1, lines 18-60).

Regarding claim 6, the plurality of sensor IC chips (112) of Saito are arranged in a straight row (Figs. 11 and 12). According to Fig. 12, the wiring pattern includes a conductive path which extends across the row of the sensor IC chips (112) and a conductive path which does not extend across the row of sensor IC chips (112) (the conductive path corresponding to the left end of each of the chips 112, as viewed in Fig. 12).

Regarding claim 7, each of the sensor IC chips (112) is provided with a plurality of connection pads (inherent connection pads inherently provided on the sensor IC chips 112 for the wires to connect to the sensor IC chips, Fig. 2), and a plurality of light receiving portions (inherent in chips 112) arranged in a straight row. According to Fig. 12, the positions of the ends of the wires (the wires extending from the top surfaces of sensor IC chips 112 as viewed in Fig. 12) connecting the sensor IC chips (112) are closer to the first side edge of the substrate (118) (the side edge of 118 that is closer to the printed circuit board 126 as viewed in Fig. 12) than to the second side edge (the side edge of 118 closer to the top of the page). Thus, the inherent connection pads associated with each of the chips (112) for the wires to connect are arranged at positions offset toward the first side edge (the side edge of 118 that is closer to the printed circuit board 126 of Fig. 12).

Regarding claim 8, Saito further discloses a connector (including terminals 124, printed circuit board 126 and connector 115 in Fig. 12) for external connection attached to the first side edge of the substrate (the side edge of 118 that is closer to printed circuit board 126 as viewed in Fig. 12) (also see Fig. 11). The connector (124, 126 and 115) is electrically connected to the wiring pattern (col. 1, lines 30-60).

C. Rejection of new claim 11

C1. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (U.S. Patent No. 6,512,603) in view of Furusawa et al. (U.S. Patent No. 6,357,903) as applied to claim 1 above, and further in view of Onishi (Japanese Publication No. 2000-125080), published April 28, 2000. Onishi was submitted by Applicant in the IDS filed June 7, 2005.

Claim 11 recites “wherein the light source comprises a light emitting diode provided on the principal surface of the substrate at a position closer to the first side edge than to the second side edge”. Saito and Furusawa et al. both disclose employ a light emitting diode (LED) as a source of light in the light source discussed above for claim 1. See Saito, Fig. 14, col. 2, lines 5-10, also refer to Fig. 11, col. 1, lines 44-45, the light source (217) comprising one or more LED arranged at the edge surface on the light guide plate (205), which edge surface is understood to be an end edge of the light guide plate (205), and see Furusawa et al., Figs. 3 and 4, col. 5, lines 31-39 and col. 6,

lines 25-26 and 47-52, the light source unit (10) comprising an LED and attached to the end of the reflector (5) of the light guide (4).

Neither Saito nor Furusawa et al. discloses providing the LED on the principal surface of the sensor substrate (18 of Saito, 8 of Furusawa et al.).

Onishi discloses an image reader comprising an LED (3) and an image sensor (2) both provided on a principal surface of the substrate (4) (Fig. 1, which shows the reader in the main scanning direction, and Figs. 2 and 4, which show cross-sectional views of the reader taken along lines III-III and lines IV-IV, respectively). Light emitting from the LED (3) enters the light guide (8) from the right end of the light guide (8) (Fig. 1).

Saito and Furusawa et al. both employ separate substrates for mounting the LED and the image sensor. One of ordinary skill in the art would have realized the advantage of providing the LED on the principal surface of the substrate, on which the image sensor is provided, to reduce the number of substrates or printed circuit boards. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the LED on the principal surface of the substrate of the obvious image reading apparatus of Saito in view of Furusawa et al. and substitute the light guide of the obvious apparatus with a light guide as shown in Fig. 1 of Onishi, in order to reduce the number of substrates and simplify the LED light source mounting structure.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cheukfan Lee whose telephone number is (571) 272-7407. The examiner can normally be reached on 9:30 a.m. to 6:00 p.m., Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward L. Coles can be reached on (571) 272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cheukfan Lee/
Primary Examiner, Art Unit 2625